What is claimed is:

1. A method of treating HSCs, comprising:

providing a quantity of HSCs, at least a portion of the HSCs lacking or having reduced expression of surface protein CD38; and

treating the quantity of HSCs *in vitro* with an α1,3-fucosyltransferase and a fucose donor forming treated HSCs, wherein the treated HSCs have enhanced binding to P-selectin or E-selectin.

2. The method of claim 1, wherein in the step of providing a quantity of HSCs, the portion of HSCs lacking or having reduced expression of surface protein CD38 have reduced bone marrow homing ability.

3. The method of claim 1, wherein in the step of providing a quantity of HSCs, the HSCs are derived from human umbilical cord blood.

4. The method of claim 3 wherein the human umbilical cord blood is an unfractionated quantity of human umbilical cord blood.

5. The method of claim 1, wherein in the step of providing a quantity of HSCs, the HSCs are derived from peripheral blood.

6. The method of claim 5 wherein the peripheral blood is an unfractionated quantity of peripheral blood.

7. The method of claim 1, wherein in the step of providing a quantity of HSCs, the HSCs are derived from bone marrow.

8. The method of claim 7 wherein the bone marrow is an unfractionated quantity of bone marrow.

9. The method of claim 1, wherein in the step of providing a quantity of HSCs, the portion of HSCs lacking or having reduced expression of surface protein CD38 comprise PSGL-1 which has unfucosylated glycans or unfucosylated O-glycans.

10. The method of claim 1, wherein in the step of providing a quantity of HSCs, the portion of HSCs lacking or having reduced expression of surface protein CD38 comprise PSGL-1 having core-2 O-glycans comprising NeuAcα2,3 Gal β1,4 GlcNAc and which are absent a fucose in α1,3 linkage to the GlcNAc or which comprise other glycans which lack proper fucosylation.

11. The method of claim 1, wherein in the step of treating the quantity of HSCs, at least 50% of the treated HSCs have P-selectin binding fluorescence which exceeds a predetermined fluorescence threshold in a P-selectin binding assay or which have E-selectin binding fluorescence which exceeds a predetermined fluorescence threshold in an E-selectin binding assay.

12. The method of claim 1, wherein in the step of treating the quantity of HSCs, the α1,3 fucosyltransferase is α1,3 fucosyltransferase IV, α1,3 fucosyltransferase VI, or α1,3 fucosyltransferase VII.

13. The method of claim 1, wherein in the step of treating the quantity of HSCs, the fucose donor is GDP-fucose.

14. A composition of HSCs; comprising:

$CD34^+$ HSCs derived from umbilical cord blood and lacking or having reduced expression of surface protein CD38, wherein at least 10% of the $CD34^+$ HSCs bind to P-selectin or E-selectin; and

a pharmaceutically-acceptable carrier.

15. The composition of claim 14 wherein at least 25% of the $CD34^+$ HSCs bind to P-selectin or E-selectin.

16. The composition of claim 14 wherein at least 50% of the $CD34^+$ HSCs bind to P-selectin or E-selectin.

17. The composition of claim 14 wherein at least 75% of the $CD34^+$ HSCs bind to P-selectin or E-selectin.

18. The composition of claim 14 wherein at least 90% of the $CD34^+$ HSCs bind to P-selectin or E-selectin.

19. The composition of claim 14 wherein at least 95% of the $CD34^+$ HSCs bind to P-selectin or E-selectin.

20. A method of treating a subject with a hematological disease or other condition requiring a transplantation of HSCs, comprising administering a quantity of the composition of claim 14 to the subject having a hematological disease or other condition requiring a transplantation of HSCs.

21. The method of claim 20 wherein the hematological disease is one of acute lymphocytic leukemia, acute myelogenous leukemia, myelodispasia, chronic myelogenous leukemia, juvenile chronic myelogenous leukemia, or sickle cell anemia.

22. A blood product comprising:

a population of human HSCs comprising cells characterized as $CD34^{+}CD38^{low/-}$, wherein at least 10% of the $CD34^{+}CD38^{low/-}$ HSCs bind to P-selectin or E-selectin.

23. The blood product of claim 22 wherein at least 25% of the $CD34^{+}CD38^{low/-}$ HSCs bind to P-selectin or E-selectin.

24. The blood product of claim 22 wherein at least 50% of the $CD34^{+}CD38^{low/-}$ HSCs bind to P-selectin or E-selectin.

25. The blood product of claim 22 wherein at least 75% of the $CD34^{+}CD38^{low/-}$ HSCs bind to P-selectin or E-selectin.

26. The blood product of claim 22 wherein at least 90% of the $CD34^{+}CD38^{low/-}$ HSCs bind to P-selectin or E-selectin.

27. The blood product of claim 22 wherein at least 95% of the $CD34^{+}CD38^{low/-}$ HSCs bind to P-selectin or E-selectin.

28. The blood product of claim 22 wherein the human HSCs are derived from human umbilical cord blood.

29. The blood product of claim 22 wherein the human HSCs are derived from peripheral blood.

30. The blood product of claim 22 wherein the human HSCs are derived from bone marrow.

31. The blood product of claim 22 further comprising a pharmaceutically acceptable carrier or vehicle.

32. The blood product of claim 22 further comprising a free fucosyltransferase or a fucosyltransferase bound to a support.

33. A blood product produced by the method comprising:

providing a quantity of HSCs, at least a portion of the HSCs lacking or having reduced expression of surface protein CD38; and

treating the quantity of HSCs *in vitro* with an α1,3-fucosyltransferase and a fucose donor to produce treated HSCs, wherein at least 10% of the treated HSCs bind to P-selectin or E-selectin.

34. The blood product of claim 33 wherein at least 25% of the treated HSCs bind to P-selectin or E-selectin.

35. The blood product of claim 33 wherein at least 50% of the treated HSCs bind to P-selectin or E-selectin.

36. The blood product of claim 33 wherein at least 75% of the treated HSCs bind to P-selectin or E-selectin.

37. The blood product of claim 33 wherein at least 90% of the treated HSCs bind to P-selectin or E-selectin.

38. The blood product of claim 33 wherein at least 95% of the treated HSCs bind to P-selectin or E-selectin.

39. The blood product of claim 33 wherein the quantity of HSCs are derived from human umbilical cord blood.

40. The blood product of claim 33 wherein the quantity of HSCs are derived from peripheral blood.

41. The blood product of claim 33 wherein the quantity of HSCs are derived from bone marrow.

42. A method of treating HSCs, comprising:

providing a quantity of HSCs; and

treating the quantity of HSCs *in vitro* with an α1,3-fucosyltransferase and a fucose donor forming treated HSCs, wherein the treated HSCs have enhanced binding to P-selectin or E-selectin.

43. The method of claim 42, wherein in the step of providing a quantity of HSCs, a portion of the quantity of HSCs has reduced bone marrow homing ability.

44. The method of claim 42, wherein in the step of providing a quantity of HSCs, the HSCs are derived from human umbilical cord blood.

45. The method of claim 44 wherein the human umbilical cord blood is an unfractionated quantity of human umbilical cord blood.

46. The method of claim 42, wherein in the step of providing a quantity of HSCs, the HSCs are derived from peripheral blood.

47. The method of claim 46 wherein the peripheral blood is an unfractionated quantity of peripheral blood.

48. The method of claim 42, wherein in the step of providing a quantity of HSCs, the HSCs are derived from bone marrow.

49. The method of claim 48 wherein the bone marrow is an unfractionated quantity of bone marrow.

50. The method of claim 42, wherein in the step of providing a quantity of HSCs, a portion of the quantity of HSCs comprise PSGL-1 which has unfucosylated glycans or unfucosylated O-glycans.

51. The method of claim 42, wherein in the step of providing a quantity of HSCs, a portion of the quantity of HSCs comprises PSGL-1 having core-2 O-glycans comprising NeuAcα2,3 Gal β1,4 GlcNAc and which are absent a fucose in α1,3 linkage to the GlcNAc or which comprise other glycans which lack proper fucosylation.

52. The method of claim 42, wherein in the step of treating the quantity of HSCs, at least 50% of the treated HSCs have P-selectin binding fluorescence

which exceeds a predetermined fluorescence threshold in a P-selectin binding assay or which have E-selectin binding fluorescence which exceeds a predetermined fluorescence threshold in an E-selectin binding assay.

53. The method of claim 42, wherein in the step of treating the quantity of HSCs, the α1,3 fucosyltransferase is α1,3 fucosyltransferase IV, α1,3 fucosyltransferase VI, or α1,3 fucosyltransferase VII.

54. The method of claim 42, wherein in the step of treating the quantity of HSCs, the fucose donor is GDP-fucose.

55. A composition of HSCs, comprising:

$CD34^+$ HSCs derived from umbilical cord blood, wherein at least 10% of the $CD34^+$ HSCs bind to P-selectin or E-selectin; and

a pharmaceutically-acceptable carrier.

56. The composition of claim 55 wherein at least 25% of the $CD34^+$ HSCs bind to P-selectin or E-selectin.

57. The composition of claim 55 wherein at least 50% of the $CD34^+$ HSCs bind to P-selectin or E-selectin.

58. The composition of claim 55 wherein at least 75% of the $CD34^+$ HSCs bind to P-selectin or E-selectin.

59. The composition of claim 55 wherein at least 90% of the $CD34^+$ HSCs bind to P-selectin or E-selectin.

60. The composition of claim 55 wherein at least 95% of the $CD34^+$ HSCs bind to P-selectin or E-selectin.

61. A method of treating a subject with a hematological disease or other condition requiring a transplantation of HSCs, comprising administering a quantity of the composition of claim 55 to the subject having a hematological disease or other condition requiring a transplantation of HSCs.

62. The method of claim 61 wherein the hematological disease is one of acute lymphocytic leukemia, acute myelogenous leukemia, myelodispasia, chronic myelogenous leukemia, juvenile chronic myelogenous leukemia, or sickle cell anemia.

63. A blood product produced by the method comprising:

providing a quantity of HSCs; and

treating the quantity of HSCs *in vitro* with an α1,3-fucosyltransferase and a fucose donor to produce treated HSCs, wherein at least 10% of the treated HSCs bind to P-selectin or E-selectin.

64. The blood product of claim 63 wherein at least 25% of the treated HSCs bind to P-selectin or E-selectin.

65. The blood product of claim 63 wherein at least 50% of the treated HSCs bind to P-selectin or E-selectin.

66. The blood product of claim 63 wherein at least 75% of the treated HSCs bind to P-selectin or E-selectin.

67. The blood product of claim 63 wherein at least 90% of the treated HSCs bind to P-selectin or E-selectin.

68. The blood product of claim 63 wherein at least 95% of the treated HSCs bind to P-selectin or E-selectin.

69. The blood product of claim 63 wherein the quantity of HSCs are derived from human umbilical cord blood.

70. The blood product of claim 63 wherein the quantity of HSCs are derived from peripheral blood.

71. The blood product of claim 63 wherein the quantity of HSCs are derived from bone marrow.

72. The blood product of claim 63 further comprising a pharmaceutically acceptable carrier or vehicle.

73. The blood product of claim 63 further comprising a free fucosyltransferase or a fucosyltransferase bound to a support.